

# **APPENDIX B**

## **Applying MOSA in a Request for Proposal**

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## **I. Introduction**

This document contains examples of language suitable for use in an RFP and supporting documents to facilitate the application of a Modular Open Systems Approach (MOSA) by offerors. The language examples are intended to be stand-alone generic statements that provide effective ways of addressing modular open systems in a particular context. You should select the examples that are useful in your particular situation. The examples are intended to be tailored, as appropriate, to meet specific program requirements.

## **II. Examples of Open System Language**

### **A. Executive Summary or Cover Letter Language**

Many contracting activities issue RFPs with a cover letter or executive summary that tells potential offerors about the requirement that needs to be satisfied and what matters most to the government. Identifying modular open systems as a key interest or goal, in the cover letter or executive summary, emphasizes to potential offerors that MOSA is important to the government. Here are examples of modular open systems language that may be appropriate in a cover letter or executive summary:

- *Provide for a system that allows for interoperability and cost effective incremental upgrade over the entire life cycle of the system without dependence upon a single source.*
- *Deploy a system characterized by life-long viability, a standard-based and robust architecture, and capability to insert new technology based on the cycle rates of the ensuing technologies in system components.*
- *Build a system that can be improved incrementally without redesign of the entire system or large portions thereof.*

### **B. Statements of Objectives (SOO) Language**

A SOO is an excellent tool for conveying to the offerors the main objectives of the acquisition. As offerors prepare their proposals they can concentrate on ensuring that they meet or exceed all of the objectives stated in the SOO. If a SOO is being used, the following examples of objectives may be used.

*The Offeror shall use modular open systems approach to:*

1. *Facilitate development of a modular architecture and allow for affordable intraoperability*
2. *Ensure that the system design is sufficiently flexible and robust to accommodate changing technology and requirements*
3. *Facilitate integration with other systems and use of commercial products from multiple sources both in the initial design and in future enhancements*
4. *Enable technology insertion as currently available commercial products mature and new commercial products become available in the future*

5. *Allow for affordable support*
6. *Allow continued access to technologies and products supported by many suppliers (a broad industrial base which does not restrict available sources to the detriment of competition)*

For systems that tend to evolve and improve with time:

*System design enables technology insertion as currently available commercial products mature and new commercial products become available in the future.*

**or**

*Enable incremental system improvements through upgrades of individual hardware or software modules with newer modular components without redesign of entire systems or large portions thereof.*

If technology obsolescence is a risk that must be managed:

*Mitigate the risks associated with technology obsolescence, being locked into proprietary technology, and reliance on a single source of supply over the life of the system.*

An overall objective to take advantage of the benefits of MOSA:

*Build the system based on modular hardware and software design, choosing commercially supported specifications and standards for selected interfaces (external, internal, functional, and physical) products, practices, and tools.*

### **C. System Requirements Documents Language**

The offerors are more likely to use MOSA as a suitable business and technical strategy for building systems when modular open systems attributes are embedded in performance/operational requirements. The following modular open systems language may be used in requirements documents such as the Capability Documents (e.g., ICD, CDD, and CPD), System Specifications, Technical Requirements Document (TRD), Performance Work Statement (PWS), Statement of Work (SOW), etc:

*The Offeror shall use a modular open systems approach to evaluate the appropriateness of implementing a modular design strategy for building systems. A primary consideration in selection of equipment to meet the design functionality shall be the impact to the overall modular open systems architecture. A modular open systems approach and analysis of long term supportability, interoperability, and growth for future modifications shall be major factors in the Offeror's final selection of equipment and integration approach. All the systems components shall facilitate future upgrades and permit incremental technology insertion to allow for incorporation of additional or higher performance elements with minimal impact on the existing systems.*

*The architectural approach shall provide a viable technology insertion methodology and refresh strategy that supports application of a modular open systems approach and is responsive to changes driven by mission requirements and new technologies.*

*The Offeror shall develop a detailed modular design and integration that includes but is not limited to the following aspects: interoperability, intra-operability, upgradeability, reconfigurability, transportability, software standards, interface standards, long term supportability, sources of supply and/or repair, business strategies, and other entities that affect application of a modular open systems approach.*

*For those portions of hardware, firmware, or software that are driven to proprietary and/or closed system architectures by mission specific requirements, a hardware/firmware/software partitioning or other design features to mitigate the system level impacts shall be provided*

*The Offeror shall provide an orderly, planned approach to address migration of proprietary or closed system equipment or interfaces to a modular design when technological advances are available.*

*The Offeror's modular design and integration shall preclude long term dependence on closed or proprietary interface standards, technologies, products, or architectures. Secure or classified data systems shall also conform to the modular design approach as much as practical. The design shall provide sufficient growth and open interface standards to allow future reconfiguration and addition of new capabilities without large-scale redesign of the system.*

#### **D. Section L Language**

Section L includes instructions for the offeror to incorporate information that evaluators will need to assess their MOSA against the evaluation criteria. The language examples that follow are intended to be stand-alone examples of "Instructions for Proposal Preparation" that might serve this purpose. Each example is not applicable to every case – you should select the examples that are useful in your particular situation.

*The proposal shall describe how the Offeror's modular open systems approach will cause the Offeror to implement an integrated business and technical strategy that employs:*

*(1) a modular design and, where appropriate, (2) defines key interfaces using (3) widely-supported, consensus-based (i.e., open) standards that are published and maintained by a recognized industry standards organization.*

*In describing the modular open systems approach, the proposal shall include:*

- *Plans for integrating the systems internally and with external system*
- *Identification of the means for ensuring conformance to widely used consensus standards (i.e., open standards) and profiles throughout the development process, and an explanation of how the modular open systems approach supports benefits such as reconfigurability, portability, interoperability, technology insertion, vendor independence, reusability, scalability, and commercial product based maintainability*

- *A description of how the technical approach ensures having access to mature as well as the latest technologies by establishing a robust, modular, and evolving architecture based on widely used consensus standards*
- *A description of how the design concept supports modular open systems approach principles*
- *A description of the strategy for maintaining the currency of technology (e.g., through COTS insertion, technology refresh strategies, and other appropriate means).*
- *Identification of processes for:*
  - *isolating functionality through the use of modular design.*
  - *identifying key interfaces.*
  - *selecting open standards for key interfaces.*
  - *specifying the lowest level (e.g., subsystem or component) at and below which they intend to control and define interfaces by proprietary standards and the impact of that upon their proposed logistics approach.*
  - *evaluating modular open systems baseline standards, defining and updating profiles, evaluating and justifying new and vendor unique profiles.*
  - *validating implementation conformance to selected profiles.*
  - *managing application conformance to selected profiles.*
  - *training in use of profiles.*

*The Offeror shall specify how they plan to use a modular open systems approach as an enabler to achieve the following objectives:*

- *Adapt to evolving requirements and threats*
- *Accelerate transition from science and technology into acquisition and deployment*
- *Facilitate systems reconfiguration and integration*
- *Enhance modularity*
- *Leverage commercial investment in new technologies and products*
- *Reduce the development cycle time and total life-cycle cost*
- *Achieve commonality and reuse of components within a system (if commonality is a requirement)*
- *Maintain continued access to cutting edge technologies and products from multiple suppliers*
- *Mitigate the risks associated with technology obsolescence, being locked into proprietary technology, and reliance on a single source of supply over the life of a system*
- *Enhance life-cycle supportability*

When the RFP is requesting proposals that will involve the modernization of legacy systems, one or more of the following language examples may be useful.

- *The Offeror shall clearly demonstrate the modular design strategy in all aspects of the system upgrade. In addressing the requirements specified, the proposal must demonstrate how the modular design strategy applies, and the effect it will have on the system upgrade. The proposal shall also provide documentation to support the rationale for a decision to integrate a proprietary or closed system hardware and/or software functions within the proposed system.*
- *The proposal shall describe the orderly planned process to address migration of proprietary or closed system equipment or interfaces to a modular open systems design when technological advances are available or when operational capability is upgraded. The proprietary or closed systems implementation shall also be reflected in the Offeror's system level life cycle cost estimates.*
- *The modular design approach shall either mitigate or partition the proprietary or closed systems implementation to avoid out-year supportability issues and diminishing manufacturing sources and sources of repair through the selection of open standards for identified key interfaces.*

## **E. Section M Language**

Listed below are indicators you may use as part of the evaluation criteria calling for application of MOSA:

### *1. Modular Design Indicators*

- 1.1 Identification of specific acquisition objectives (e.g., affordability, ease of change, leveraging commercial investment in new technology, etc.) and operational capabilities (e.g., ease of integration, interoperability, etc.) directly or indirectly dictate the use of open systems in your program.*
- 1.2 A system architecture characterized by modular design.*
- 1.3 The degree to which the program risk management strategy and MOSA complement each other.*
- 1.4 Justification of modular open system design via business case analysis (e.g., cost/benefit analysis, market research findings, etc.).*

### *2. Key Interface Indicators*

- 2.1. Proactive management of system interfaces.*
- 2.2. Identification of key system interfaces based on the module characteristics (e.g., criticality of function, ease of integration, change frequency, interoperability, commonality, etc.).*
- 2.3. Appropriate designation of open standards for key system interfaces.*

### *3. Open Standards Indicators*

- 3.1. Feasibility studies to assess the use of open standards for key interfaces.*

*3.2. Application of a standards selection process that gives preference to open standards.*

*3.3. Standards selection for key interfaces is based on application of specific criteria (e.g., DoD mandate, industry consensus, market support, prime contractor recommendation, etc.).*

*Additionally, does the Offeror's proposal provide the User with the ability to:*

- *quickly interconnect, reconfigure, and assemble existing forces, systems, subsystems, and components?*
- *interchange and use information, services and/or physical items among components within a system?*
- *interchange and use information, services and/or physical items among systems within an integrated architecture, platform, domain, or a DoD Component?*
- *support reuse of software and the common use of components across various product lines?*
- *transfer a system, component, or data, from one hardware or software environment to another?*
- *adapt hardware or software to accommodate changing work loads?*

The following list of language should be selected to correspond with specific requirements or instructions provided to the offerors in prior sections of the RFP.

- *Does the Offeror's information technology architecture support interface requirements analysis, evolution of system capabilities, and selection of modular and open systems-based software and hardware?*
- *How consistent is the Offeror's overall sustainment strategy and execution approach with the modular open systems approach?*
- *How well does the proposal demonstrate that the modular design approach, plans for technology insertion, and sustainment strategy are consistent with the modular open systems requirements/objectives in Section C?*
- *How does the Offeror's system design satisfy the requirement for a modular design approach that uses consensus standards adopted by recognized standards organizations and/or widely-used commercial standards for key interfaces within the system?*
- *Is the Offeror's design process or systems engineering approach capable of achieving the following modular open systems objectives:*
  - *Enhance interoperability and the ability to integrate new capabilities without redesign of entire systems or large portions thereof*
  - *Enable rapid reconfiguration of systems and forces*
  - *Adapt to evolving threats and technologies by managing to the natural upgrade cycles of technologies used in a system*

- *Improve life-long supportability and reduce total cost of ownership via continued access to multiple sources of supplies and services*
  - *Allow incremental system improvements through upgrades of individual hardware or software modules with newer modular components*
- *Does the Offeror's design approach achieve identified modular open system benefits such as higher performance, life-long supportability, reduced total ownership costs and development cycle time, lower risks associated with technological obsolescence and dependency on a single source of supply, and other requirements such as integrability, scalability, and portability?*
- *Does the Offeror have a plan to manage the impact of changing requirements and evolving technology on system's ability to continue to satisfy improved capabilities over time?*
- *Does the Offeror's design approach propose to define interfaces in sufficient completeness and detail such that selected element(s) can be replaced and/or modified in a competitive environment with minimal modifications to other system elements while maintaining equal or improved system performance and capability?*
- *Does the Offeror's approach comply with modular open systems objectives/requirements such as continued access to multiple suppliers and improved performance through affordable modernization?*
- *Does the Offeror's test and evaluation planning contain means for testing the conformance to open standards to ensure the openness of key interfaces throughout the system life cycle?*
- *Does the Offeror's approach contain capabilities to easily and quickly update, revise, and change the system as threats or technologies evolve?*

These are just a few examples of language that can be used to formulate a tailored MOSA for meeting the business and technical objectives of your program. These statements can be documented in your acquisition planning process and throughout all of your program and contractual documentation. Once you have decided on how to apply MOSA to your program, you will be able to lay a clear trail that starts with acquisition planning and can be traced from your objectives to requirements to evaluation criteria and throughout execution of the program.